IBM WebSphere Extended Deployment for z/OS, V6.1 unifies management of mixed workloads

At a glance

WebSphere Extended Deployment for z/OS V6.1 delivers the following enhanced capabilities:

- Batch enhancements, including:
  - Job management console
  - Dynamic adjustment to changing workload using dynamic servants
  - Service policy coordination
  - Job scheduler that runs fully clustered in either a static or dynamic cluster
  - Support for integration with other job scheduling systems
  - Simplified programming model, non-EJB style
- Extended manageability enhanced with customizable health policies and corrective actions, based on threshold or trend metrics
- Flexible purchase options: Repackaged features available as separately orderable features

Overview

WebSphere® Extended Deployment for z/OS® V6.1 offers enhanced quality of service focused on the J2EE application layer. It integrates with and extends the core functions of an existing WebSphere Application Server for z/OS installation. The following new capabilities can improve the quality of service of your business-critical applications.

Flexible support for mixed application types:

- Improvements to job management, including integration with popular workload scheduling systems
- New console offering essential job management functions
- New job type called native execution added to transactional batch and compute intensive that supports a more flexible programming style for distributed endpoints
- Simplified, non-EJB programming model for transactional batch jobs

When combined, these features provide you with more flexibility for executing a broad mix of application types under WebSphere Extended Deployment.

Reliable, scalable, high-performance:

- Significant performance improvements in high-volume on-line transaction processing environments through shared data objects across applications
• Support for the ObjectGrid base client feature, which can improve the performance of individual applications

• Support for a broad range of innovative application scenarios by connecting the ObjectGrid base client on z/OS with ObjectGrid distributed resources to gain the benefits of enhancements made in WebSphere Extended Deployment V6.1

Dynamic operations: For environments where z/OS is the centralized platform, providing management across multiple distributed platforms including Linux™ on System z™, WebSphere Extended Deployment V6.1 offers new workload management and health policy support for PHP servers and expanded support for other application servers.

Extended manageability: To improve overall availability of complex systems and the applications they support, you need flexible, automated monitoring designed into the infrastructure. WebSphere Extended Deployment implements a new health policy design that includes customizable health monitoring policies. These policies help you to determine which situations to monitor and the actions to take when a specific situation arises. This gives you the control necessary for developing a health policy specific to your environment, and improving the availability of your business applications.

Flexible purchase options: In addition to the full product containing all features, you can order the following separately chargeable features.

• Operations Optimization for dynamic operations
• Data Grid for high-performance
• Compute Grid for running and controlling batch-like jobs

You can purchase only the feature you need today or take advantage of the attractive price by purchasing the full product. Trade-ups are available if you require the full product later.

IBM Global Technology Services offers consulting services to assist with the design and implementation of your WebSphere Extended Deployment environment, and to help reduce the time to value for your investment. For more information, visit


For more information about WebSphere Extended Deployment for z/OS, visit


Key prerequisites

• WebSphere Application Server for z/OS V6.1
• z/OS V1.6 or z/OS.e V1.6, or later

Planned availability date

May 25, 2007
Streamlined product packaging structure offering flexible purchase and deployment options

WebSphere Extended Deployment for z/OS V6.1 offers an additional product structured so you can purchase individual components for product deployment flexibility. The complete product remains available.

Two products are available:

- **WebSphere Extended Deployment for z/OS V6.1** includes all product functions:
- **WebSphere Extended Deployment for z/OS V6.1 by Individual Components** offers the following features:
  - WebSphere Extended Deployment Operations Optimization
  - WebSphere Extended Deployment Compute Grid
  - WebSphere Extended Deployment Data Grid

Summary of product component functions:

- **WebSphere Extended Deployment Operations Optimization**
  - Virtualization
  - Workload routing (HTTP, SOAP, JMS)
  - Workload traffic shaping and flow control
  - Policy-based workload management
  - Dynamic application placement
  - Health management
  - Operational management
  - Visualization
  - Application Edition Management

- **WebSphere Extended Deployment Compute Grid**
  - Transactional batch workload services
  - Compute-intensive workload services
  - Job scheduling and management services

- **WebSphere Extended Deployment Data Grid**
  - ObjectGrid
  - Partitioning facility

Enhanced integration of dynamic operations and infrastructure optimization with z/OS workload management and job management

WebSphere Extended Deployment for z/OS focuses on improving the delivery of the highest quality environment for Java™ applications by enabling dynamic operations. Dynamic operations enhance the value delivered by the platform integration of the WebSphere Application Server for z/OS. Further, WebSphere Extended Deployment’s policy-based workload prioritization complements the workload management features provided by the z/OS workload manager.

Service policy is the application of business performance goals to WebSphere workloads using WebSphere Extended Deployment. While z/OS workload manager focuses on a System z view of varying workloads, WebSphere Extended Deployment's focus is strictly on the J2EE application layer.

WebSphere Extended Deployment for z/OS V6.0 introduced support for two additional workloads beyond on-line transaction processing (OLTP): Java batch processing with transactional semantics and compute-intensive application support. Typically, these types of batch applications are siloed and not fully integrated with the existing OLTP application infrastructure.
With WebSphere Extended Deployment Compute Grid for z/OS V6.1 organizations can run both OLTP and compute-intensive workload within the same application server and have WebSphere Extended Deployment intelligently manage and prioritize the work.

Further, as workload increases for Compute Grid jobs, it can be challenging to automatically scale infrastructure resources in response to these increased and dynamic workload demands. To address this, WebSphere Extended Deployment for z/OS V6.1 introduces dynamic servants to the Compute Grid environment. Dynamic servants exploit z/OS workload manager capabilities to automatically start new servants to execute Compute Grid workloads, including Java transactional batch, on demand. With this capability the z/OS workload manager can dynamically add application servers in response to an influx of Compute Grid jobs.

In addition, WebSphere Extended Deployment and the z/OS workload manager support enhanced service policy coordination. Because the z/OS workload manager applies rules-driven service policy to work similar to WebSphere Extended Deployment, the two service policy management schemes need to be more tightly integrated. Therefore, WebSphere Extended Deployment for z/OS V6.1 leverages the workload classification to select the z/OS service class. It propagates the transaction class from the Compute Grid job scheduler to the z/OS application server endpoint for job registration with the z/OS workload manager.

Enhanced service policy and workload management for Compute Grid jobs include:

- Rules-based service policy methodology.
- New completion time service policy goal.
- Innovative job classes that establish policies for resource consumption. They enable management and control of execution time, the number of concurrent jobs, and the size of job log and job output queue storage.

Often you need to integrate the submission, monitoring, and control of Compute Grid workloads with existing job management and control software. This integration is especially important on platforms that manage a significant amount of batch workload such as the System z and z/OS. WebSphere Extended Deployment Compute Grid for z/OS V6.1 now provides service interfaces to enable integration with external scheduling and job management environments such as the IBM Tivoli® Workload Scheduler to submit, monitor, and control Compute Grid batch jobs. The interfaces can easily be made to work with any job scheduling environment available for z/OS. WebSphere Extended Deployment Compute Grid for z/OS 6.1 includes integration software for the IBM Tivoli Workload Scheduler.

Previous versions of WebSphere Extended Deployment delivered intelligent, goals-directed workload management, infrastructure optimization, and operational management primarily on the WebSphere Application Server. With WebSphere Extended Deployment V6.1 in AIX®, HP-UX, Linux, Solaris, and Windows™ environments, IBM extends dynamic operations, infrastructure virtualization, and intelligent application placement to a broad range of application infrastructure resources (PHP, BEA WebLogic, JBoss, Apache Tomcat, and WebSphere Application Server Community Edition).

This enhancement is important for environments where z/OS is the centralized platform, but management is required across multiple distributed platforms including Linux on System z. You can run WebSphere Extended Deployment Operations Optimization on z/OS to control and manage workload that can run on both z/OS and distributed platforms.

Streamlined testing and deployment across heterogeneous application types

Installation, configuration, and deployment of applications with multiple components such as those provided by WebSphere Extended Deployment Compute Grid can present even more challenges. With multiple execution components, these applications can further strain administrators’ ability to deploy them.

With WebSphere Extended Deployment Compute Grid for z/OS V6.1, you can install required components as part of the WebSphere Extended Deployment runtime and activate them through a simple configuration change via standard WebSphere administration interfaces. In addition, two new features further facilitate deployment of these types of applications:

- **Requirements-based job scheduling** automatically establishes the set of resources eligible to execute a job based on job requirements and resource capabilities.
- **Unit test environment** offers a simple packaging structure for developing and testing Compute Grid jobs on a single WebSphere Application Server.

Increased levels of operational control, robustness, and proactive health management
across the application infrastructure

As you begin to deploy new application types and loosely coupled composite business services across your application infrastructure, concerns about complexity, operational management, and availability can increase. It can also be difficult to monitor and maintain many applications across multiple LPARs within a System z infrastructure. While the WebSphere Application Server for z/OS administration console delivers excellent built-in capabilities, the special needs of more complex deployments require an aggregated, meaningful view of the application run-time environment.

In previous versions, WebSphere Extended Deployment for z/OS delivered comprehensive health and operational monitoring capabilities for proactive detection and correction of application and server issues. To further facilitate the integration of health monitoring and management with existing practices, customization of both health policies and their associated corrective actions is now supported:

- **Administrators can create custom health policies** to create health conditions that they would like to monitor based on their infrastructure. These policies are expressions that can be a combination of metrics; for example, absolute breach thresholds or trends such as increasing or decreasing. You can specify health policies based on custom error response code conditions. The system can detect cases where servers are producing an unusually large number of error response codes.

- **Administrators can configure custom health actions** for health policies. One or more actions can be configured for an individual health policy as an orderable list of steps; when health conditions are triggered, health actions can be performed either under supervision or fully automated.

WebSphere Extended Deployment operational control and management is also significantly enhanced. Sharing of infrastructure resources is an important enabler of infrastructure optimization along with the ability to dynamically allocate resources according to business goals and priorities. Some environments, such as those seen in multitenant hosting environments, require the isolation of infrastructure resources to particular applications. To support these environments, WebSphere Extended Deployment for z/OS V6.1 introduces dynamic cluster isolation policies. Three different isolation policies are supported:

- **No isolation**, the default policy, indicates to the application placement controller that dynamic cluster instances can be colocated with any other running process when placed on a node.

- **Strict isolation policy** indicates that when an instance is placed on a node, it must not be colocated with any other running instances. An instance can be colocated only with other instances of itself, sometimes referred to as vertical stacking.

- **Associate with isolation group** policy indicates that you can place instances on nodes running other dynamic cluster instances as long as they are both members of the same isolation group.

Debugging or tuning a server in its run-time environment can be particularly difficult without having to bring the entire server offline. WebSphere Extended Deployment for z/OS V6.1 introduces a new server state called **server maintenance mode**, which facilitates this process. While in maintenance mode, a server can be either running or stopped. While running, the routing of all traffic stops. Applications and Compute Grid jobs, which are in progress, are allowed to finish.

Additionally, WebSphere Extended Deployment for z/OS V6.1 enhances data logging and metrics for resource usage and workload execution, including SMF type 120 (J2EE) records for Compute Grid batch workloads.

**Support for a rich set of innovative, flexible, and highly scalable types and patterns**

Organizations continue to deploy new, innovative application types on the z/OS platform. These applications are being driven by streamlined development of Web applications, access to computational and information resources previously inaccessible, and the strategic use of Java across both the batch and OLTP environments. The confluence of these trends has led to an unprecedented opportunity for organizations to develop new types of innovative applications and to streamline their application development efforts.

In an ongoing trend to simplify the programming model and experience for Compute Grid developers, developers can now construct Compute Grid Java transactional batch applications using a much simpler, non-EJB programming style than previously supported.

Many types of applications require the use of flexible, data-intensive, and data-sharing
application patterns with extreme scalability requirements. Data concerns are increasingly tightly integrated within application patterns and in some cases application flows are entirely driven by data flow patterns and their associated events. This is especially true for service-oriented architectures (SOA).

The WebSphere Extended Deployment Data Grid for z/OS V6.1 supports the client environment, enabling z/OS applications to either accelerate performance of individual applications via caching or connect with distributed ObjectGrid resources to enable high-performance, scale-out applications. These scenarios include:

- **Simple data and database:** An application may simply want to access its data structures to improve data performance and throughput using an ObjectGrid configuration as a cache. This is the traditional data caching scenario. ObjectGrid enhances this scenario by offering rollback capability.
- **Peer-to-peer and shared:** A set of peer Java Virtual Machines (JVMs) can be wired together with an enterprise service bus (ESB) publishing events across the set of virtual machines.
- **Client/server:** A JVM can have a local ObjectGrid that sits in front of a remote ObjectGrid and caches a subset of the data. This allows a client to leverage a very large remote cache to offload backend processing or to speed access to cached results. Clients can use the distributed locking services provided by the remote ObjectGrid to coordinate access to shared data across clients.
- **Real-time data and Event Mining™:** A partitioned ObjectGrid configuration can subscribe to events, apply them to partitioned data, and run continuous queries on each partition to produce aggregate data in real time. It thereby supports linear scalability for these application types. z/OS ObjectGrid clients can receive the aggregated results via a user-defined proxy in the distributed ObjectGrid environment.
- **Ultra-scale data grid:** Distributed ObjectGrid clients can invoke agents that run against data in parallel on all machines in an ObjectGrid. Clients can then further aggregate the data stored in the ObjectGrid in parallel and return the data to the z/OS client.

To enable these flexible configurations, the WebSphere Extended Deployment Data Grid for z/OS V6.1 offers enhancements to support application innovation including enhanced query capabilities and data structures:

- **Applications can use a query language** to issue queries against a set of mapsets across an ObjectGrid configuration.
- **Temporal query support** enables a continuous query to be executed and the results kept up to date, in real time.
- **Support for first-in, first-out (FIFO) ordering of mapsets** allows in-memory queues with a range of persistence options enabled by either synchronous or asynchronous replication.

### Accessibility by people with disabilities

You can request a U.S. Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance at


### Value Unit-based pricing

Value Unit pricing for eligible IBM eServer® System z IBM International Program License Agreement (IPLA) programs enables a lower cost of incremental growth and enterprise aggregation. Each System z IPLA product with Value Unit pricing, has a single price per Value Unit and a conversion matrix, called Value Unit Exhibit, for converting from some designated measurement to Value Units. Most commonly, Millions of Service Units (MSUs) is the measurement designated by IBM to be converted to Value Units. Some other measurements are engines or messages. Since MSUs are the most common measurement, that measurement will be used for the remainder of this description.

Value Unit pricing offers price benefits for you. For each System z IPLA program with Value Unit pricing, the quantity of that program needed to satisfy applicable IBM terms and conditions is referred to as the required license capacity. Each of the various Value Unit Exhibits stipulate that the larger your required license capacity, the fewer Value Units per MSU you will need. Value Unit Exhibits are uniquely identified by a three digit code and referred to using the nomenclature VUExxx, where xxx is the three digit code.
Subsequent acquisitions of Value Unit priced programs offer additional price benefits. The quantity of each System z IPLA program that you have acquired is referred to as entitled license capacity. If you want to increase your entitled license capacity for a System z IPLA program, the calculation to determine additional needed Value Units is based upon the number of Value Units already acquired.

For each System z IPLA program with Value Unit pricing, you should:

- Determine the required license capacity, in MSUs
- Aggregate the MSUs across the enterprise
- Convert the total MSUs to Value Units, using the applicable Value Unit Exhibit
- Multiply the price per Value Unit by the total number of Value Units to determine the total cost

To simplify conversion from the designated measurement to Value Units or vice-versa, use the Value Unit Converter Tool. For additional information or to obtain a copy of the Value Unit Converter Tool, visit the Value Unit Converter Tool Web site

http://ibm.com/zseries/swprice/vuctool

Note that Value Units of a given product cannot be exchanged, interchanged, or aggregated with Value Units of another product.

To determine the required license capacity for the System z IPLA program you selected, refer to the Terms and conditions section.

Product positioning

The WebSphere Application Server product family encompasses many possible deployment options, from low-end investigative to extreme high-end production environments.

- **WebSphere Application Server for z/OS** delivers all the function of the Network Deployment product, and is optimized to use the unique qualities of service provided by System z hardware and the z/OS operating system.

- **WebSphere Extended Deployment** delivers a dynamically scalable, easily manageable, and high-performance environment for running mixed application types and workload patterns. It works with either WebSphere Application Server for z/OS or WebSphere Application Server Network Deployment.

As application deployments become more critical and require more qualities of service, they become more attuned to the delivery of the z/OS WebSphere platform opportunities, such as WebSphere Application Server for z/OS and WebSphere Extended Deployment for z/OS. Allow your applications to grow into high-end deployments by building portable J2EE applications and mobilizing them.

WebSphere Extended Deployment Compute Grid for z/OS 6.1 includes integration software for **Tivoli Workload Scheduler**, allowing WebSphere jobs to be managed as part of the overall production workload. **Tivoli Workload Scheduler for z/OS** provides planning for hundreds of thousands of jobs, resolves interdependencies, and launches and tracks each job.

WebSphere Extended Deployment also integrates with Enterprise Workload Manager to broaden workload prioritization across application tiers. If needed, WebSphere Extended Deployment can coordinate workload with Enterprise Workload Manager to achieve enterprise-wide defined business goals more quickly.

WebSphere Extended Deployment delivers a real-time operational monitoring environment for WebSphere applications. You can use application management products, such as IBM Tivoli Composite Application Manager, to further investigate and analyze the root cause of any application performance or server health problems that are uncovered by the operational monitoring features of WebSphere Extended Deployment.

Reference information

- **A07-0192**, dated April 24, 2007
### Availability of national languages

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<thead>
<tr>
<th>Description</th>
<th>Availability date</th>
<th>Language</th>
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<tr>
<td>IBM WebSphere Extended Deployment for z/OS V6.1</td>
<td>May 25, 2007</td>
<td>English</td>
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<tr>
<td>IBM WebSphere Extended Deployment for z/OS V6.1 by Individual Components</td>
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